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Report to Congressional Requesters

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DEFENSE BUDGET

Potential Reductions to DOD's Fiscal Year 1989 Ammunition Budget

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General Accounting Office
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National Security and
International Affairs Division

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October 20, 1988

The Honorable John C. Stennis
Chairman, Committee on Appropriations
United States Senate

The Honorable Bill Chappell, Jr.
Chairman, Subcommittee on Defense
Committee on Appropriations
House of Representatives

As you requested, we reviewed the military services' justifications for their fiscal year 1989 budget requests for ammunition items and the Army's request for ammunition production base support. In April 1988 we provided your offices with some observations and questions on various ammunition line items for which fiscal year 1989 funds had been requested. In May and June 1988 we briefed your offices on the results of our review. This report includes the information provided at those briefings and provides the final results of our review.

We are sending copies of the report to the Secretaries of Defense, the Army, the Navy, and the Air Force; the Commandant of the Marine Corps; and other interested parties.

for Bill W. Thurman
Frank C. Conahan
Assistant Comptroller General

Executive Summary

Purpose

The Chairmen, Senate Committee on Appropriations and Subcommittee on Defense of the House Committee on Appropriations, asked GAO to review the military services' justifications for their fiscal year 1989 budget requests for ammunition and the Army's request for modernizing and expanding the ammunition production base.

Background

The military services' fiscal year 1989 ammunition budget request was $3.1 billion, as shown in table 1.

Table 1: Military Services' Fiscal Year 1989 Ammunition Budget Request

Dollars in millions

Military service	Amount
Army	$1,800.0
Navy	439.9
Air Force	677.7
Marine Corps	225.3
Total	**$3,142.9**

The services justified their ammunition requests by stating that the funds were needed for training and a war reserve stockpile. The Army requested an additional $207.8 million for ammunition production base support, $104.4 million of which was intended for modernizing and expanding the ammunition production base.

Results in Brief

GAO concluded that the request for modernizing and expanding the ammunition production base is adequately supported. However, about $614 million, or 19.5 percent, of the $3.1 billion ammunition request is not adequately justified and should not be funded—$249.4 million for the Army, $62.6 million for the Navy, $293.6 million for the Air Force, and $8.4 million for the Marine Corps.

Principal Findings

Army Ammunition Program

The Army's $1.8 billion request for ammunition is overstated by $249.4 million for the following reasons:

- $151.9 million is for seven items for which total program quantities will not be delivered during the fiscal year 1989 funded delivery period.
- $57.4 million is for two items with unresolved functioning problems.
- $18.1 million is for an item with an overstated unit cost and an optimistic production schedule.
- $18.1 million is for two items for which program quantities are greater than needed.
- $3.9 million is for a developmental item that will not be approved for production and troop use in time to be included in the fiscal year 1989 budget.

In addition, $214.9 million for two items may not be needed because the Army may not be able to get some components needed to make the items. One of the two items has a problem that surfaced during ballistics testing which has not been resolved.

Navy Ammunition Program

The Navy's $439.9 million request for ammunition is overstated by $62.6 million for the following reasons:

- $18.1 million is for three items that have production problems.
- $23.5 million is for two items for which programmed procurements are premature.
- $9.9 million is for an item that requires additional testing prior to full production approval.
- $5.4 million is for seven items that are not needed because inventories will exceed requirements.
- $2.8 million is for an item with an overstated unit cost and an optimistic production schedule.
- $1.3 million is for an item for which a component is available from stock.
- $1.6 million is for an item with insufficient budget justification.

Air Force Ammunition Program

The Air Force's $677.7 million request for ammunition is overstated by $293.6 million for the following reasons:

- $156.7 million is for three items for which total program quantities will not be delivered during the fiscal year 1989 funded delivery period.
- $89.5 million is for an item that requires additional testing to demonstrate the reliability of the weapon system.
- $30.3 million is for two items that are not needed because inventory would exceed requirements.

- $16.3 million is for an item that has production problems.
- $0.8 million is for an item with an overstated unit cost and an optimistic production schedule.

Marine Corps Ammunition Program

The Marine Corps' $225.3 million request for ammunition is overstated by $8.4 million for the following reasons:

- $4.9 million is for an item for which total program quantities will not be delivered during the fiscal year 1989 funded delivery period.
- $3.5 million is for an item with an overstated unit cost and an optimistic production schedule.

Recommendations

GAO recommends that the Senate and House Committees on Appropriations reduce the Department of Defense's fiscal year 1989 ammunition budget by the following amounts:

- $249.4 million for 13 items in the Army's request,
- $62.6 million for 16 items in the Navy's request,
- $293.6 million for eight items in the Air Force's request, and
- $8.4 million for two items in the Marine Corps' request.

These recommended reductions are summarized by budget line number in appendixes I, II, III, and IV.

Agency Comments

GAO did not obtain agency comments on the report. GAO discussed the results of its work with Army, Navy, Air Force, and Marine Corps officials. They agreed with some of GAO's recommended reductions and identified items for which funding could be increased. GAO included in its report, but did not evaluate, the potential funding increases identified by these officials.

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Abbreviations

ADAM	area denial artillery munitions
CEM	combined effects munition
CIWS	close-in weapon system
GAO	General Accounting Office
HE	high explosive
JATO	jet assisted takeoff
mm	millimeter
SAM	surface-to-air missile
TP-T	target practice-traced

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Introduction

As shown in table 1.1, the military services' fiscal year 1989 ammunition budget request was about $3.3 billion, including the Army's $207.8 million request for production base support.

Table 1.1: Military Services' Fiscal Year 1989 Budget Requests for Ammunition and the Ammunition Production Base

Dollars in millions

Military service	Amount
Army	$2,007.8
Navy	439.9
Air Force	677.7
Marine Corps	225.3
Total	**$3,350.7**

The funds requested for ammunition will be used to meet training needs and build a war reserve stockpile. The Army's production base support request includes $104.4 million for 14 projects to modernize and expand the ammunition production base.

Objectives, Scope, and Methodology

The Chairmen, Senate Committee on Appropriations and Subcommittee on Defense of the House Committee on Appropriations, asked us to assess the services' justifications for their amended fiscal year 1989 budget request for ammunition and the Army's request for modernizing and expanding the ammunition production base to identify potential adjustments where warranted.

We evaluated the ammunition budget requests by reviewing such factors as ammunition requirements, inventory levels, production problems, item quality, testing and development, funded program status, unit costs, and field malfunctions to identify those items with potential problems. We also analyzed production schedules, production capacities, past production, procurement lead times, and component deliveries to determine whether the services can execute the ammunition programs efficiently and economically. We compared projected inventory levels to training usage to ensure that inventories would not greatly exceed objectives. We also determined whether there will be sufficient quantities of components to produce end items. We did not verify the accuracy of data the services provided, such as inventory levels and training usage, but compared such information with data provided in previous years for reasonableness.

To evaluate projects for modernizing and expanding the ammunition production base, we determined whether designs were completed prior to budget submission and whether the projects were needed to satisfy production requirements.

In conducting our evaluation, we interviewed ammunition production managers, procurement officials, quality assurance and engineering staff, and reviewed various documents, such as briefings, program status reports, production problem meeting minutes, ballistics test reports, and budget support data that we obtained at the following locations:

- Army, Navy, and Air Force Headquarters, Washington, D.C.;
- U.S. Army Armament, Munitions and Chemical Command, Rock Island, Illinois;
- U.S. Army Production Base Modernization Activity, Picatinny Arsenal, New Jersey;
- U.S. Army Missile Command, Redstone Arsenal, Alabama;
- Office of Project Manager for Binary Munitions, Aberdeen Proving Ground, Maryland;
- Project Office, Tank Main Armament Systems, Picatinny Arsenal, New Jersey;
- Project Office, Cannon Artillery Weapons Systems, Picatinny Arsenal, New Jersey;
- Product Office, Mines, Countermines and Demolitions, Picatinny Arsenal, New Jersey;
- Project Office, Mortars, Picatinny Arsenal, New Jersey;
- Fire Support Armaments Center, Picatinny Arsenal, New Jersey;
- Naval Air Systems Command, Washington, D.C.;
- Naval Sea Systems Command, Washington, D.C.;
- Ships Parts Control Center, Mechanicsburg, Pennsylvania;
- U.S. Air Force Systems Command, Aeronautical Systems Division, Wright-Patterson Air Force Base, Ohio;
- U.S. Air Force Systems Command, Armament Division, Eglin Air Force Base, Florida;
- Ogden Air Logistics Center, Hill Air Force Base, Utah; and
- Naval Ordnance Station, Indian Head, Maryland.

We discussed a draft of this report with program officials of the Army's Office of the Program Executive Officer for Ammunition, the Navy's Office of the Deputy Chief of Naval Operations for Logistics, the Air Force's Office of the Deputy Chief of Staff for Logistics and Engineering, and the Marine Corps' Office of Deputy Chief of Staff for Installations and Logistics. We made changes to the report, where appropriate, to

reflect the views of these officials. As requested, we did not obtain official agency comments on the report.

We conducted our review from November 1987 to June 1988 in accordance with generally accepted government auditing standards.

Army Ammunition Program

The Army requested $1.8 billion for ammunition and $207.8 million for ammunition production base support in its fiscal year 1989 ammunition budget request. The production base support request includes $104.4 million for 14 projects to modernize and expand the ammunition production base. We reviewed the justifications for 52 ammunition items (representing $1.6 billion, or about 89 percent of the request) and 7 of 14 production base projects for modernizing and expanding the ammunition production base (representing $65.3 million, or about 63 percent of the $104.4 million request). We also reviewed the design status for all 14 production base projects. Appendix I shows the ammunition budget lines we reviewed and the potential reductions we identified. In total, we believe that the Army does not need $249.4 million in fiscal year 1989 for 13 ammunition items for the following reasons:

- $151.9 million is for seven items for which total program quantities will not be delivered during the fiscal year 1989 funded delivery period.
- $57.4 million is for two items with functioning problems.
- $18.1 million is for an item with an overstated unit cost and an optimistic production schedule.
- $18.1 million is for two items for which program quantities are greater than needed.
- $3.9 million is for a developmental item that will not be approved for production and troop use in time for the fiscal year 1989 budget.

In addition, $214.9 million for two items may not be needed because the Army may not be able to obtain some components needed to make these items. Further, one of the two items has a problem that surfaced during ballistics testing and has not been resolved.

Deliveries Not Within Funded Delivery Period

According to Army budget guidance, ammunition program quantities for which funds are being requested should be delivered within the fiscal year's funded delivery period. The funded delivery period for an ammunition item is the time in months from first delivery of the ammunition item to last delivery for a specific fiscal year's procurement. It begins the last month of the procurement lead time and ends 12 months later. For example, if the procurement lead time for an ammunition item in the fiscal year 1989 budget is 15 months, the funded delivery period would start on December 1, 1989, and end on November 30, 1990. Since ammunition programs are funded each year, funding should not be provided for ammunition items that will be delivered after the funded delivery period.

The Army's fiscal year 1989 ammunition budget request should be reduced by $151.9 million because all or part of the quantities the Army requested for the following seven items will not be delivered within the fiscal year 1989 funded delivery period:

- $51.5 million for 13,000 155-millimeter (mm) area denial artillery munitions (ADAM) projectiles,
- $37 million for 36,000 8-inch rocket assisted projectiles,
- $20.1 million for 155-mm GB-2 projectiles,
- $19.3 million for 12,600 Volcano mine canisters,
- $15 million for 46,000 155-mm smoke projectiles,
- $5.2 million for 17,000 Hydra 70 high explosive point detonating rockets, and
- $3.8 million for 8,000 Hydra 70 multipurpose submunition rockets.

155-mm ADAM Projectiles

The Army's $51.5 million request for 13,000 155-mm M731 ADAM projectiles should not be funded because there are 72,000 undelivered projectiles in the fiscal year 1988 and prior year budgets for the Army and Marine Corps, and this undelivered quantity is sufficient to support one-shift production beyond the fiscal year 1989 funded delivery period.

Malfunctioning components, delay detonators in particular, have plagued the ADAM projectile for several years. As a result, production at the Louisiana Army Ammunition Plant has slipped about 16 months. In our report on the Department of Defense's fiscal year 1988 budget request for ammunition,[1] we reported that ADAM projectiles had continuing ballistics test failures and unresolved problems with delay detonators.

In March 1987, the Army formed an action team to identify and resolve the various problems with the projectile, and numerous changes, which are being implemented, were made to the projectile. However, as demonstrated by Army schedules in its budget backup documents, the fiscal year 1988 and prior year Army and Marine Corps program quantity of 72,000 projectiles is more than enough to support a one-shift production rate of 1,764 projectiles a month through the end of the fiscal year 1989 funded delivery period. We conclude, therefore, that fiscal year 1989 funding is not needed.

[1]Defense Budget: Potential Reductions to DOD's Fiscal Year 1988 Ammunition Budget (GAO/NSIAD-88-29, Oct. 27, 1987).

Army representatives said that the problems with the components have been resolved and that by working overtime the Louisiana plant can produce the fiscal year 1989 program quantity within the funded delivery period. Our review showed, however, that the Army would not know whether it has solved the production problems until the ADAM rounds incorporating the changes were ballistically tested in August 1988 or later. Further, since the Army does not plan to request funding for the ADAM projectile in fiscal year 1990, we believe it would be more prudent to operate the Louisiana plant on a one-shift basis without overtime. This would sustain production for a longer period, avoid overtime costs, and enhance industrial preparedness because of a more active production base.

8-Inch M650 Rocket Assisted Projectiles

The Army's $37 million request for 36,000 8-inch, rocket assisted projectiles for fiscal year 1989 should not be funded because of production delays. The Army had to shut down the projectile assembly line at the Iowa Army Ammunition Plant in January 1988 because rocket motor bodies were not available and production is not scheduled to restart until September 1988. As a result of this delay, 103,000 projectiles remain to be produced from the fiscal year 1988 and prior year programs, and none of the 36,000 projectiles requested for fiscal year 1989 will be produced during the fiscal year 1989 funded delivery period ending in September 1990.

Army officials said that the shortage of rocket motor bodies is attributable to delays in approving and awarding small business set-aside contracts. To alleviate the shortage, the Army asked the two contractors to increase their production of rocket motor bodies so that enough bodies would be available to produce the requested fiscal year 1989 quantity within the funded delivery period. The contractors verbally agreed to increase production to 3,860 projectiles per month. At this rate, it will take until at least September 1990 to produce the fiscal year 1988 and prior year programs. Thus, none of the requested fiscal year 1989 quantity can be produced by the end of the fiscal year 1989 funded delivery period. We therefore believe that the entire $37 million request for 36,000 projectiles should not be funded.

Army officials said that they expect to have enough rocket motor bodies to support production of 5,000 projectiles a month at the Iowa plant. However, as indicated above, the contractors agreed to produce at a rate sufficient to support assembly of 3,860 projectiles a month, which

would provide insufficient rocket motors to produce the requested fiscal year 1989 program within its funded delivery period.

155-mm M687 GB-2 Projectile

The Army's $66 million request for a classified number of 155-mm M687 GB-2 projectiles should be reduced by $20.1 million because the Army does not plan to produce a portion of the requested quantity within the fiscal year 1989 funded delivery period.

The Army's production schedule at the Pine Bluff Arsenal requires completing and operating a new chemical production facility in order to produce the projectiles. The contract for that facility was awarded in January 1988, and the Army anticipates that full-scale production will start in January 1990. According to the Army, the new plant will not be available in time to produce a portion of the fiscal year 1989 program quantity within the fiscal year 1989 funded delivery period. Therefore, the $20.1 million requested for that quantity should not be provided in fiscal year 1989. Army representatives agreed that the quantity cannot be produced and that the request should be reduced by $20.1 million.

Volcano Mine Canister

The Army's $73.9 million fiscal year 1989 request for 48,000 M87 Volcano mine canisters should be reduced by $19.3 million for 12,600 canisters because the existing end-item assembly capacity is inadequate to produce that quantity within the fiscal year 1989 funded delivery period.

Approval of type classification as a standard item, which indicates that the item is ready for full-scale production and ready for troop use, is required before canisters can be procured for fiscal years 1988 and 1989. Type classification, however, has been delayed and was not scheduled to take place until September 27, 1988, due to a retesting requirement. As a result, the Army plans to combine the procurements of the 12,000 canisters in the fiscal year 1988 budget with the 48,000 canisters requested for fiscal year 1989. It also plans to operate the two ammunition plants that produce the item on a two-shift basis.

Based on the assembly capacities at the two Army ammunition plants, we estimated that 12,600 of the 60,000 canisters in the fiscal years 1988 and 1989 budgets cannot be delivered by the end of the fiscal year 1989 funded delivery period. Therefore, funding of $19.3 million for 12,600 canisters is unnecessary. Army representatives agreed with the reduction.

155-mm M825 Smoke Projectiles

The Army's $19.5 million request for 60,000 155-mm M825 smoke projectiles should be reduced by $15 million for 46,000 projectiles because that quantity is scheduled to be delivered after the fiscal year 1989 funded delivery period.

The Army stopped producing M825 projectiles at the Pine Bluff Arsenal from November 1986 to January 1988 for several reasons:

- New canisters with redesigned felt wedges had to be produced to resolve the projectile's erratic flight and smoke-density problems.
- Start-up of a second supplier of the new canisters was delayed due to an embargo of a felt supplier located in South Africa.
- Additional production delays were caused by leaking canisters.

Because of the production delays, as of May 13, 1988, the Army and Marine Corps had 311,000 undelivered projectiles from the fiscal years 1984 through 1988 budgets.

Army budget backup documents show that 46,000 of the 60,000 projectiles requested in fiscal year 1989 will not be produced within the fiscal year 1989 funded delivery period. The Army's fiscal year 1989 budget should therefore be reduced by $15 million for the 46,000 projectiles. Army representatives agreed with the reduction.

Hydra 70 Rockets

The Army requested $9 million in fiscal year 1989 for two different types of Hydra 70 rockets that should not be funded because, according to Army budget documents, these rockets will not be produced within the fiscal year 1989 funded delivery period. Table 2.1 shows the Army's request for these rockets.

Table 2.1: Army's Fiscal Year 1989 Request for Hydra 70 Rockets

Dollars in millions

Description	Quantity	Amount
Multipurpose submunition practice (M267)	8,000	$3.8
High explosive point detonating (M151/M423/MK66)	17,000	5.2
Total	**25,000**	**$9.0**

Army officials agreed that the $9 million is not needed in fiscal year 1989 for these two items, but for a different reason. They said that funding for these items is no longer necessary because they prefer to train with different rockets.

Unresolved Functioning Problems

The Army's fiscal year 1989 budget request of $57.4 million for two types of 4.2-inch mortar cartridges should not be funded because the cartridges are not functioning properly.

4.2-Inch M335A2 Illuminating Cartridge

The Army's $37.4 million request for 193,000 4.2-inch M335A2 illuminating mortar cartridges should not be funded because an excessive dud problem has not been resolved.

During ballistic testing of the cartridges in 1987, half of the production lots (9 out of 18) failed because they contained an excessive number of duds. The duds, according to Army officials, are attributable to unstable cartridge flight that causes the timer in the M577 fuze to stop before the fuze is fully armed. An Army analysis indicated that the M577 fuze may be incompatible with the 4.2-inch cartridge and, in 1988, recommended that the Army develop an alternate fuze or buy more of the older M565 fuzes before buying M335A2 cartridges. However, the M565 fuze is no longer in stock and is uneconomical to procure, according to an Army official.

Army representatives said that the problem with the unstable cartridge flight is being corrected by moving the center of gravity forward, that it will take 10 months to complete the modification and testing at an estimated cost of $600,000, and that funding is available. An Army engineer said, however, that additional time will be needed for an engineering change proposal to modify drawings and incorporate them into procurement packages, and the modification and testing program is not scheduled to begin until fiscal year 1989. We therefore believe that the $37.4 million to buy M335A2 projectiles is premature.

4.2-Inch M329A2 HE Mortar Cartridge

The Army requested $20 million for 200,000 4.2-inch M329A2 high explosive (HE) mortar cartridges. We do not believe that the request should be funded because the cartridge has continuously failed ballistics tests since the second quarter of fiscal year 1987 and the Army has not yet identified the cause of the problem. In addition, as of July 1, 1988, 838,000 cartridges were to be produced from the fiscal year 1988 and prior year programs. We estimated that production of this quantity will extend through the fiscal year 1989 funded delivery period, precluding the need for additional funds in fiscal year 1989.

Ballistics test reports showed that 8 of 22 production lots tested during fiscal year 1987 and the first half of fiscal year 1988 were rejected

because the cartridges had abnormal flights. Army engineers recommended additional tests to identify the cause of the problem, but at the time of our review, the tests had not started.

The Army's budget justification documents showed scheduled production of 204,000 cartridges from February 1988 through May 1988, with production continuing at 50,000 a month through March 1990. Actual production from February 1988 through May 1988 was 83,200 cartridges and production stopped in June 1988 for production of 2.75-inch rockets and renovation of existing mortar cartridges. Production of M329A2 cartridges was expected to resume in September 1988. Further, the 50,000 scheduled rate, according to Army officials, will not be achieved until July 1989 when the supplier of projectile metal parts is expected to accelerate production. We therefore believe that the Army's production schedule is overoptimistic.

Army representatives said that the fiscal year 1989 program can be completed within the funded delivery period by adding a second shift that would be staffed by the current work force. We believe that additional funding should not be provided in fiscal year 1989 because the Army has yet to identify and resolve the functioning problems, has experienced a 3-month slippage in production due to a shutdown, has about 107,000 cartridges in reject status that may have to be reworked, and has enough prior year program quantities available to maintain production through the fiscal year 1989 funded delivery period.

Overstated Unit Cost and Optimistic Production Schedule

The Army's $71.6 million request for the lightweight multipurpose weapon, known as the AT-4, should be reduced by $18.1 million because the Army's budgeted cost for the AT-4 weapon is overstated and the scheduled production is overoptimistic. The Army and other services requested $104.1 million to buy 113,508 AT-4 weapons in fiscal year 1989, as shown in table 2.2.

Table 2.2: Military Services' Fiscal Year 1989 Budget Request for AT-4 Weapons

Dollars in millions

Service	Quantity	Amount
Army	77,263	$71.6
Navy	17,533	15.2
Marine Corps	14,912	13.8
Air Force	3,800	3.5
Total	**113,508**	**$104.1**

We believe that $25.2 million of the total request is unnecessary for two reasons—$9.8 million because estimated costs were overstated and $15.4 million because 18,508 weapons are not producible during the fiscal year 1989 funded delivery period.

The Army, Air Force, and Marine Corps used a unit cost of $926.23 in their budget submissions, and the Navy used a unit cost of $864.15. According to Army representatives who are responsible for procuring the weapons for all three services, the correct unit cost is $830.22. Based on this unit cost, the total budget request for the AT-4 weapon is overstated by $9.8 million.

An additional $15.4 million is unnecessary because the production schedule is overly optimistic. The Army has been buying the weapon from a Swedish manufacturer. In order to establish a U.S. production capability, the Army contracted with Honeywell, the licensee for the weapon in the United States, for a low-rate, initial-production quantity of 2,500 weapons in the fiscal year 1987 program with options for fiscal years 1988 through 1991. Honeywell will produce these weapons at the Joliet Army Ammunition Plant and has scheduled a production quantity of 370 weapons for July 1989 and the remainder (2,130 weapons) for September and October 1989. The contract provides options to purchase from 95,000 to 120,000 weapons per program year, which is equivalent to a monthly production rate of 7,917 to 10,000 weapons.

The services received funding for 107,300 weapons for fiscal year 1988. If the fiscal year 1989 request for 113,508 weapons is fully funded, about 223,000 weapons must be produced in the 18-month period between September 1, 1989, and February 28, 1991, which is the end of the fiscal year 1989 funded delivery period. According to the Army's budget backup data, production is scheduled at an average rate of about 12,300 weapons a month over the 18-month period. However, the contractor's production schedule shows a maximum monthly production quantity of 10,000 weapons for the fiscal year 1988 program.

Based on the contractor's scheduled production rate of 10,000 weapons a month, 180,000 weapons could be produced during the 18-month period ending February 28, 1991. Therefore, about 43,000 weapons would not be delivered within the fiscal year 1989 funded delivery period. However, a reduction of 43,000 weapons would reduce fiscal year program quantities to 70,508 weapons, or 24,492 below a minimum contract option of 95,000 weapons. Thus, we believe that any reduction should be limited to 18,508 weapons because a larger reduction would

require renegotiation of the contract. Therefore, $15.4 million for 18,508 of the requested 113,508 weapons is not needed in fiscal year 1989. Allocating this reduction to the services in proportion to their requests results in a potential reduction of $10.6 million to the Army's request, as shown in table 2.3.

Table 2.3: Potential Reductions to Services' Budget Requests for AT-4 Weapons

Dollars in millions

Service	Overstated unit cost	Optimistic production schedule	Total
Army	$7.5	$10.6	**$18.1**
Navy	0.6	2.2	**2.8**
Air Force	0.3	0.5	**0.8**
Marine Corps	1.4	2.1	**3.5**
Total	**$9.8**	**$15.4**	**$25.2**

In June 1988 Army representatives told us that 15,000 weapons could be produced by Honeywell using two full shifts and that Honeywell could produce 10,000 weapons per month by doing 90 percent of the work during one shift and the remaining 10 percent using a partial second shift. The Army representatives also said that a 13,000 monthly production rate could easily be achieved and that the fiscal year 1989 program quantity would be delivered in a timely manner. However, contractor officials told us that they plan to produce a maximum of 10,000 weapons per month.

Inventory Will Exceed Requirements

A total of $18.1 million of the $24.6 million requested for two items is not needed because the Army's request provides greater quantities than needed. Specifically, the amounts and the items are

- $10.2 million for 25-mm M793 Target Practice-Traced (TP-T) cartridges and
- $7.9 million for 7.62-mm M80 ball cartridges.

25-mm M793 TP-T Cartridge

The Army does not need the $10.2 million requested for 1,145,000 25-mm M793 TP-T cartridges in fiscal year 1989 because the inventory will exceed Army requirements without a fiscal year 1989 program, as shown in table 2.4.

Table 2.4: Excess Inventory of 25-mm M793 Cartridges

Inventory as of September 30, 1987	464,000
Due in from prior year programs	6,379,000
Total	**6,843,000**
Less estimated usage through September 30, 1990	−3,146,000
Projected inventory on September 30, 1990	3,697,000
Less inventory objective	−2,051,000
Total excess	**1,646,000**

An Army objective in procuring training ammunition is to acquire a sufficient quantity for training and to maintain a predetermined depot level of inventory. The Army can meet this inventory objective without a fiscal year 1989 program.

Army officials said that the official usage estimates in the budget justification data have been revised upward since the budget was prepared, and they provided us with the new estimates. However, these revised estimates were overstated because they included a projected use of 690,000 M793 cartridges to fulfill a portion of the fiscal year 1989 training authorization for the 25-mm XM910 armor piercing training cartridges that Army representatives told us are not ballistically matched and are not interchangeable. Therefore, a portion of the XM910 training authorization included in the M793 consumption estimates is not justified. Using the Army's revised consumption estimates for the M793, minus the 690,000 cartridges to be used in lieu of the XM910, the Army will still exceed its inventory objective during the fiscal year 1989 funded delivery period without a 1989 program.

7.62-mm M80 Ball Cartridge

Approximately $7.9 million for 31,481,000 cartridges of the Army's $14.4 million request for 58,560,000 7.62-mm M80 ball cartridges is unnecessary because procuring that quantity would result in excess inventory at the end of the fiscal year 1989 funded delivery period, as shown in table 2.5.

Table 2.5: Excess Inventory of 7.62-mm M80 Ball Cartridges

Inventory as of September 30, 1987	22,862,000
Due in from prior year programs	5,246,000
Fiscal year 1989 request	58,560,000
Total	**86,668,000**
Less estimated usage through June 30, 1990	−31,469,000
Projected inventory on June 30, 1990	55,199,000
Less inventory objective	−23,718,000
Total excess	**31,481,000**

Therefore, the fiscal year 1989 budget could be reduced by $7.9 million without affecting the Army's ability to provide sufficient cartridges for training and maintain a predetermined depot level of inventory.

Army officials agreed that the inventory will exceed their objective at the end of the fiscal year 1989 funded delivery period but said that the inventory will be less than their objective in future years.

Type Classification Delayed

The Army requested $3.9 million for 105,000 40-mm M651 tactical cartridges for fiscal year 1989. The request should not be funded because type classification is not anticipated until at least the fourth quarter of fiscal year 1989.

Type classification identifies items that are acceptable for their intended missions and for introduction into the inventory. Army policy states that, in general, an item to be procured in a particular fiscal year should be type classified no later than the end of the first quarter of that fiscal year. Therefore, December 1988 is the type classification deadline for items to be included in the fiscal year 1989 budget.

Army budget backup documents show that the M651 cartridge was type classified in 1971. It was last produced 12 years ago at Pine Bluff Arsenal. According to Army officials at the Arsenal, they cannot produce the cartridge using the existing technical data package because numerous changes were made, but the changes were not incorporated into the technical data package. The project engineer estimated that type classification would require 3 years if a new technical data package is developed and at least 18 months if the item is procured commercially. Either way, the cartridge cannot be type classified by the end of the first quarter of fiscal year 1989. Army officials agreed that the cartridge could

not be type classified in time for the fiscal year 1989 procurement and that the requested funding would not be needed in fiscal year 1989.

Questionable Items

The Army's budget requests for two items—$111.7 million for 149,000 155-mm M864 basebleed projectiles and $103.2 million for 221,000 155-mm M483A1 projectiles—are questionable because the Army may not be able to get components needed for the projectiles. Further, the Army has not resolved a problem with nose cones splitting on the M483A1 projectiles during ballistic testing.

155-mm Basebleed Projectile

The Army requested $111.7 million in fiscal year 1989 for 149,000 155-mm M864 projectiles. This request is questionable because the Army may not be able to implement its proposed acquisition strategy for acquiring component parts in a timely manner.

In September 1987 the Army awarded low-rate initial-production contracts for the projectile's base burner assembly and primary metal parts. Deliveries of these components are scheduled to start in December 1988. In March 1987, the Army awarded a contract for the end-item assembly facility at the Milan Army Ammunition Plant. This facility was expected to achieve its required production capacity by July 1988. The M864 projectile was type classified for full-scale production in December 1987.

The Army plans to procure the projectile's critical component parts from private sources and government-owned production facilities to meet its production requirements for fiscal years 1988, 1989, and 1990. Base burner assembly quantities are to be split between the sole-source contractor scheduled to produce the low-rate, initial-production quantity and a competitively selected second source. Primary metal parts are to be procured from a competitively selected commercial source and a small business set-aside source. Pending final approval, the four contracts were scheduled to be awarded by September 1988.

Two other metal parts are to be produced by the Louisiana and Scranton Army Ammunition Plants contingent upon establishing production facilities at those locations. In August 1987, the Army awarded a contract for an initial-production facility at the Scranton plant. The Army also plans to expand the existing production capability at the Louisiana plant. In 1987 production at both plants was expected to start by January 1989; now production is scheduled to start in June 1989.

Army representatives said that although there was a delay in the scheduled production start, they do not anticipate further delays and expect the fiscal year 1989 program to be produced on schedule.

155-mm M483A1 Projectile

The Army requested $103.2 million in fiscal year 1989 for 221,000 155-mm M483A1 projectiles. However, it may not be able to implement its proposed acquisition strategy for buying critical component parts in a timely manner and within budget estimates because of recurring malfunctions of various components.

The Army encountered a cracked base plate problem in the early 1980s that required screening the inventory and replacing base plates. The problem resurfaced when the Army found that the projectile base plates also corrode and develop cracks. Because cracked base plates are a critical defect, the Army plans to replace them in its inventory (about 3.5 million) as well as those being produced. New base plates from a new alloy cost about $21 each, and the Army estimates that it will cost an additional $10 per projectile to replace the base plates on projectiles in the inventory. The Army considered reducing production of M483 projectiles when the problem was discovered but did not do so because it would have resulted in laying off 1,330 contractor employees at the load, assemble, and pack plants.

The Army also encountered a fiberglass wrap separation problem with the projectiles produced at the Mississippi Army Ammunition Plant. The Army is planning to remove the fiberglass and rewrap 141,755 projectiles at the Mississippi plant at a cost of $40 per projectile. The Army also plans to remove the fiberglass and rewrap an additional 12,733 projectiles produced at the plant and shipped to various Army installations.

Most recently, the Army encountered a problem with nose cones splitting when the projectiles were fired. Between January 1, 1988, and June 15, 1988, 11 of the 29 production lots produced at the Kansas and Mississippi Army Ammunition Plants and submitted for ballistics tests were rejected because nose cones had split. The Army is currently conducting an investigation to determine the cause of this problem.

Due to the problems identified above, the Army may not be able to implement its acquisition strategy for the M483A1 projectile within the fiscal year 1989 funded delivery period.

Ammunition Production Base Support

The Army's fiscal year 1989 ammunition production base support request of $207.8 million includes $104.4 million for 14 facility projects to modernize and expand the ammunition production base. We reviewed the status of designs for all 14 projects and found that, where applicable, the final design had been completed prior to budget submission. We also reviewed the justification for seven projects estimated to cost $65.3 million. The need for the seven projects appears to be valid, based on our review.

Army's Proposed Budget Increases

Army representatives identified a list of items for which they believed additional funding could be used in fiscal year 1989. The Army provided the list after we had completed our fieldwork, and we did not evaluate the justification for these items. However, the list includes items for which we have recommended reductions in the fiscal year 1989 budget. Items the Army proposed for increases are shown in table 2.6.

Table 2.6: Army's Proposed Budget Increases

Dollars in millions

Item	Amount
Nuclear weapons support	$1.0
5.56-mm all types	21.1
7.62-mm all types	14.5
30-mm M788 cartridge	1.6
60-mm smoke cartridge	2.0
60-mm M720 HE cartridge	21.2
105-mm M724 cartridge	4.0
120-mm M831 cartridge	6.7
120-mm M865 cartridge	25.7
35-mm T716 sub-caliber cartridge	2.7
155-mm M864 projectile	23.3
155-mm M804 projectile	10.0
Propelling charge, M3	2.7
Propelling charge, M203	15.4
Hydra 70 M274 practice rocket	11.7
Components for renovation	9.4
Production base support	25.5
Fuze, M762 electronic time	1.5
Total	**$200.0**

Conclusion

We believe that $249.4 million of the Army's fiscal year 1989 request is not needed because (1) seven items cannot be delivered within the funded delivery period, (2) two items have unresolved functioning problems, (3) estimated costs for one item are overstated and the production schedule is overoptimistic, (4) the inventory for two items will exceed objectives if funded, and (5) type classification is too late for one item.

Recommendation

We recommend that the Senate and House Committees on Appropriations reduce the Army's ammunition budget by $249.4 million for 13 items, as shown in appendix I.

Chapter 3

Navy Ammunition Program

The Navy's fiscal year 1989 budget request consists of $439.9 million for 28 ammunition budget lines. We examined the Navy's justifications for items in 16 of these budget lines representing $310.8 million, or about 71 percent of the funds requested. Appendix II shows the budget lines reviewed and the potential reductions we identified. In total, we believe that the request could be reduced by $62.6 million for the following reasons:

- $18.1 million is for three items that have production problems.
- $23.5 million is for two items for which the programmed procurements are premature.
- $9.9 million is for an item that requires additional testing prior to full production approval.
- $5.4 million is for seven items that are not needed because inventory would exceed requirements.
- $2.8 million is for an item with an overstated cost and an optimistic production schedule.
- $1.3 million is for an item whose unit price could be lowered by using an available component.
- $1.6 million is for an item with insufficient budget justification.

Production Problems

A total of $18.1 million of the Navy's request for three items is not needed because of problems encountered in the production of prior year programs. The items and amounts are as follows:

- $9.4 million for 2.75-inch MK66 rocket motors,
- $4.9 million for MK83 practice bombs, and
- $3.8 million for 5-inch, 54-caliber HIFRAG projectiles.

2.75-Inch MK66 Rocket Motor

The Navy's $9.4 million request for 45,657 2.75-inch MK66 rocket motors should not be funded because of problems in producing a required component—MK90 propellant grains. The lack of propellant grains has delayed production of MK66 rocket motors, and a March 1988 explosion at the Radford Army Ammunition Plant, which produces the propellant grains, has caused additional delays. To help alleviate the shortage of propellant grains, production has been increased at the Naval Ordnance Station, Indian Head, Maryland.

The Army, Navy, and Air Force use MK66 rocket motors, and, as of April 1988, 938,300 motors were to be produced from fiscal year 1988 and prior years. Prior to the explosion, the total production capacity for

propellant grains at the Radford and Indian Head plants was expected to be sufficient to produce 42,000 MK66 rocket motors monthly. The current plans are for the Indian Head plant to produce propellant grains for 30,000 motors a month and the Radford plant to produce enough propellant grains for 15,000 motors a month starting in April 1989. Both locations are expected to continue producing propellant grains at those levels until the backlog is eliminated and the program is on schedule.

According to the Navy's budget backup data, the procurement lead time for the rocket motor is 15 months. Therefore, production of the fiscal year 1989 program should be completed in November 1990. Our analysis indicates that if the Indian Head and Radford plants produce propellant grains as planned, there will still be a shortage of propellant grains for about 132,000 rocket motors that are needed to eliminate the backlog and complete the fiscal year 1989 program within the funded delivery period.

In view of the large quantity of rocket motors to be produced from prior year programs, current constraints, and the uncertainty concerning future production levels of propellant grains, we believe that the Navy's fiscal year 1989 budget request of $9.4 million for 45,657 rocket motors should not be funded. In addition, as indicated in chapter 4, we believe that the Air Force's fiscal year 1989 request of $16.3 million for 90,000 rocket motors should not be funded for the same reasons.

Navy and Air Force representatives said that the fiscal year 1989 program can be delivered by the end of the fiscal year 1989 funded delivery period. They based their position, in part, on an 18-month procurement lead time. However, we found no support for using more than a 15-month procurement lead time, and there are indications that the lead time may be shorter than 15 months. In addition, our analysis of scheduled production of the MK90 propellant grains clearly indicates that there will not be enough propellant grain available to complete the MK66 rocket motor program.

MK83 Practice Bomb

The Navy's $4.9 million request for MK83 practice bombs should not be funded because of production problems with component parts. As of March 1988, the Navy had not received any of the 24,880 MK83 practice bombs funded since fiscal year 1986. Lack of MS3314 suspension lugs and M73 cable assemblies has delayed production of MK83 practice bombs and resulted in the current backlog. Each MK83 practice bomb uses two suspension lugs and one cable assembly.

The contracting activity has experienced difficulty in finding contractors capable of producing the components. In September 1986, a contract was awarded for 952,000 MS3314 suspension lugs to satisfy the lug requirements of all services. As of March 1988, the contractor had delivered about 41,400 lugs, which was 462,000 fewer lugs than scheduled. Several attempts to produce M73 cable assemblies have been unsuccessful. In January and February 1988, three replacement contracts were awarded to two contractors for 20,685 M73 cable assemblies. Production of the cable assemblies will start after successful completion of first article testing. However, as of August 1988 no date had been established for the first article testing of the M73 cable assemblies, and neither contractor has produced these cable assemblies. Given the uncertain availability of the M73 cable assemblies and the MS3314 suspension lugs, we believe that the Navy's $4.9 million fiscal year 1989 request for MK83 practice bombs should not be funded.

Navy representatives do not agree. While they recognize a slippage in scheduled cable assembly deliveries, they anticipate no further problems in the production of the cable assemblies and suspension lugs. We believe the Navy is overoptimistic. Since the lug contractor is behind schedule and there is uncertainty surrounding the capabilities of the new cable assembly contractors, we believe the Navy's fiscal year 1989 request should not be funded.

5-Inch, 54-Caliber HIFRAG Projectiles

The $3.8 million for 5,616 HIFRAG projectiles in the Navy's $48.6 million request for 5-inch, 54-caliber gun ammunition is not needed because of continued production problems in the Navy's HIFRAG program. Since the initial buy in fiscal year 1981, the HIFRAG program has been delayed by several problems.

As of March 1988 the Navy had received funding for 75,430 HIFRAG projectiles that were undelivered, as shown in table 3.1.

Table 3.1: Undelivered HIFRAG Projectiles

Fiscal year	Program amount	Program quantity	Undelivered quantity
1981	$8,192,248	10,000	7,260
1984	17,660,313	18,768	18,768
1985	14,301,414	23,415	23,415
1986	8,674,035	9,763	9,763
1987	3,026,626	8,160	8,160
1988	7,927,374	8,064	8,064
Total	**$59,782,010**	**78,170**	**75,430**

Last year, we reported that the production of HIFRAG projectiles was delayed by the contractors' failure to produce acceptable components and the need for design changes to alleviate problems discovered during testing. The Navy needs to revise the technical data package before any production can be scheduled. However, the Navy does not plan to revise the technical data package until it completes tests to ensure that the projectile works properly.

Navy officials believe that the program should be funded. They said that production of first article has started and that test results should soon be available. In addition, single piece retaining bands are being produced at a sufficient rate to meet planned level of production of the HIFRAG projectile.

Production of the fiscal year 1981 program quantity started in May 1988 and is expected to be completed in September 1988. However, as of August 19, 1988, none of the projectiles produced since May 1988 had been tested. According to the production manager, the undelivered projectiles for fiscal years 1984 through 1988 will be produced at the rate of 2,500 projectiles a month starting in October 1988. At this rate, it will take 28 months, or until January 1991, to produce the undelivered prior year quantity.

In view of the delays in producing projectiles and the resulting large undelivered quantity from prior years, we believe additional funding is not needed in fiscal year 1989.

Premature Procurements

A total of $23.5 million of the Navy's request is premature because of program delays. The items and amounts are as follows:

- $14.8 million for a 16-inch submunition round and

- $8.7 million for a laser-guided training round.

16-Inch Submunition Round

The $14.8 million requested for 16-inch submunition rounds is not needed because of delayed production approval.

The Navy received $8.1 million in funding for fiscal years 1987 and 1988 for the procurement of 676 submunition rounds. Last year the Navy anticipated that a product improvement program for this item would be completed and production would be approved in June 1987. However, the program has been delayed and the Navy's fiscal year 1989 budget backup data indicated that the contract award for the initial procurement of submunition rounds would be made in June 1988.

Navy representatives agreed that the product improvement program has been delayed and that the funds received for fiscal years 1987 and 1988 have not yet been used, but they believed that they could catch up. However, as of August 1988, the product improvement program was still ongoing, and Navy personnel said that the improvements would not be completed until September 1988. In view of the delays in completing the product improvement program and in producing the quantities funded for fiscal years 1987 and 1988, we believe that additional funding is premature.

Laser-Guided Training Round

The Navy requested $14.5 million for 10,000 laser-guided training rounds. We believe that $8.7 million of the request is not needed because only one version of the training round is expected to be ready for procurement during fiscal year 1989.

Navy personnel said that the budget data is incorrect because it reflects the requirements for full production rather than low-rate, initial production as intended. The budget request also reflected an incorrect unit price that was based on full rather than initial production. Navy personnel were unable to provide a unit cost for the initial production but estimated that the unit price could be two to three times greater than the $1,450 unit cost shown in the budget.

The Navy is developing two types of laser-guided training rounds—an unpowered version to be used in laser guided bomb training and a powered version that will provide training for Skipper weapons. The Navy's developmental program anticipates that only the unpowered version will be ready for low-rate, initial production by fiscal year 1989; the

low-rate, initial production for the powered version is not scheduled until after fiscal year 1990. The Navy's full-scale development program anticipated a limited production of 4,000 units, with procurements split equally between each version.

Because only the unpowered version of the laser-guided training round is expected to be ready for initial production, the fiscal year 1989 procurement quantity should be 2,000 units. Since the initial production unit cost is not known but is probably understated, we believe that increasing the budget unit cost to $2,900 (double the budget figure) is not unreasonable. Therefore, we believe $5.8 million, or $8.7 million less than requested, is sufficient for laser-guided training rounds. Navy representatives agreed with the recommended reduction.

Additional Testing Needed

The combined Navy and Air Force request of $99.4 million for Bigeye chemical weapons ($9.9 million by the Navy and $89.5 million by the Air Force) is not needed because additional testing to demonstrate the reliability of the weapon system is required. In addition, contracts have only recently been awarded for the construction of Bigeye production facilities. These production facilities are needed to produce the low-rate, initial-production quantity, which will be subjected to reliability testing.

With the January 1988 presidential determination that production of the Bigeye weapon system is needed, fiscal year 1986 funds totaling $90 million were released to construct three Bigeye production facilities. Contracts for these three facilities were awarded in February and March 1988. The production facilities and their estimated completion dates are shown in table 3.2.

Table 3.2: Estimated Construction Completion Dates for Bigeye Production Facilities

Facility	Estimated construction completion date
Metal parts	October 1989
Load, assemble and pack	February 1990
Chemical QL	March 1990

Bigeye tests completed in December 1987 showed that the weapon did not meet reliability requirements. Additional testing will be done between February and May 1990 to demonstrate reliability before approval for full production is requested. Based on those tests, the Navy anticipates that an approval for full production decision could be made

in August 1990, which is 28 months later than the April 1988 date shown in the Navy's fiscal year 1989 budget backup data.

In view of the need for additional reliability testing, we believe that the $99.4 million for Bigeye chemical weapons is not needed in fiscal year 1989. We understand why the Navy plans to expand the production rate for Bigeye metal parts as soon as possible. However, we believe that the production rate should not be expanded before the reliability of the weapon system is fully demonstrated.

The Bigeye program manager does not agree. He believes that the risk associated with increasing the production rate is acceptable because actions to correct prior problems have already been taken and the additional testing is expected to fully demonstrate the weapon system's reliability requirement. However, considering that additional testing needs to be done to demonstrate the reliability requirement and that the three production facilities need to be completed, we do not believe that the fiscal year 1989 funding request to increase the production rate should be granted.

Inventory Will Exceed Requirements

A total of $5.4 million for seven items is not needed because the additional procurements will result in inventories that exceed the Navy's objectives:

- $2.9 million for two types of close-in weapon system (CIWS) ammunition,
- $1.5 million for the MK23 jet assisted takeoff (JATO) rocket motor and its MK296 igniter, and
- $1 million for three Smokey SAM items.

CIWS Ammunition

The Navy's $40.7 million request for CIWS ammunition includes $2.5 million for 396,200 20-mm dummy rounds and $0.4 million for 152,300 M55 target practice rounds. The planned CIWS procurements will result in inventory levels that exceed the Navy's objectives by about 1,510,000 dummy rounds and about 216,000 M55 target practice rounds. Therefore, we believe that the $2.9 million for these CIWS rounds is not needed.

Navy representatives agreed that the planned procurements would result in inventory levels that exceed the Navy's objectives but said that the funds could be used to purchase additional quantities of MK149 CIWS ammunition.

MK23 JATO Rocket Motor and MK296 Igniter

The Navy's $4.8 million request for JATO includes $1.5 million for 275 MK23 rocket motors and MK296 igniters. The planned procurements will result in inventory levels that exceed the Navy's objectives by 1,134 rocket motors and 589 igniters. Therefore, we believe that the requested funding for the MK23 JATO rocket motor and the MK296 igniter is not necessary.

Navy representatives agreed that inventory levels would exceed the Navy's objectives for these items. They said that these funds could be used to support other JATO programs, such as production engineering, product improvement, and integrated logistics support. The JATO budget request already includes about $1.8 million for these efforts.

Smokey SAM Ammunition

The Navy's $2.2 million request for miscellaneous air-launched ordnance includes about $1 million for three types of simulated surface-to-air missiles called Smokey SAM ammunition—15,000 rockets, 15,000 igniters, and 140 launchers. The planned procurements will result in inventory levels that exceed the Navy's objectives by 30,400 rockets, 19,300 igniters, and 205 launchers. Therefore, the requested $1 million for Smokey SAM ammunition is not needed. Navy representatives agreed.

Overstated Unit Cost and Optimistic Production Schedule

The Navy's $33.4 million request for small arms and landing party ammunition includes $15.2 million to buy 17,533 AT-4 weapons. As discussed in chapter 2, the Navy's $15.2 million request for the AT-4 weapon should be reduced by $2.8 million because costs were overstated and production schedules are overoptimistic.

Available Component

A total of $1.3 million of the Navy's $9.5 million request for 76-mm gun ammunition is not needed because the request includes the cost of buying fuzes that are available from stock.

The Navy's request includes $2.8 million for the purchase of 5,087 high explosive variable time cartridges. This cartridge and another 76-mm cartridge (a variable time non-fragmentation cartridge) use the MK417 fuze. On most prior procurements of these cartridges, the MK417 fuze was government-furnished material. To satisfy the fuze requirements, the procurement activity awarded two contracts totaling 57,009 fuzes. Outstanding procurements for these two 76-mm cartridges require 42,000 fuzes, leaving a balance of 15,009 fuzes. Of the 15,009 fuzes, 13,060 were designated for future renovations of 76-mm cartridges. However, as

of April 1988, there was no requirement for renovating 76-mm cartridges.

We believe that 5,087 of the fuzes set aside for renovation could be used to satisfy the fiscal year 1989 high explosive variable time cartridge requirement. The unit cost of the MK417 fuze is estimated at $263.65. Using these fuzes, the fiscal year 1989 request for 76-mm gun ammunition could be reduced by $1.3 million.

Navy representatives did not agree. They said that the MK417 fuze would also be used on 3-inch, 50-caliber cartridges, and the fuzes designated for renovation could be used on unserviceable stocks of these cartridges. However, our review of documentation pertaining to the procurement of the 13,060 MK417 fuzes showed that they were bought to renovate 76-mm ammunition. Therefore, we believe that some of the MK417 fuzes designated for renovation can be used for the fiscal year 1989 high explosive variable time cartridge program.

Insufficient Budget Justification

The Navy's $4.8 million request for JATO includes $1.6 million for the pioneer rocket assisted takeoff, for which the Navy did not provide sufficient justification. We requested support for the request, and although Navy representatives agreed to provide it, as of August 1988 they had not done so. Therefore, we believe the $1.6 million request for the pioneer rocket assisted takeoff should not be granted.

Navy's Proposed Budget Increases

Navy representatives identified numerous items for which program quantities could be increased. Although we did not evaluate the justification for these items, we noted that the list includes items for which we have recommended reductions to the fiscal year 1989 budget request. Items the Navy proposed for increases are shown in table 3.3.

Table 3.3: Navy's Proposed Budget Increases

Dollars in millions

Item	Amount
General purpose bombs	$54.2
Practice bombs	23.2
Gator	9.1
Machine gun ammunition	5.1
2.75-inch rocket	2.3
Miscellaneous cartridges	2.0
Aircraft escape rockets	1.6
Airborne expendable countermeasures	0.6
5-inch, 54-caliber ammunition	108.7
Other ship gun ammunition	83.7
Small arms and landing party ammunition	33.6
16-inch gun ammunition	26.9
Pyrotechnics and demolition	13.5
3-inch, 50-caliber ammunition	11.2
76-mm gun ammunition	4.8
5-inch, 38-caliber ammunition	0.4
Total	**$380.9**

Conclusion

We believe that $62.6 million of the Navy's fiscal year 1989 request is not needed because (1) three items are experiencing production problems, (2) programmed procurements for two items are premature, (3) one item requires additional testing prior to full production approval, (4) the inventory for seven items will exceed requirements if funded, (5) one item has an overstated cost and an optimistic production schedule, (6) a component for one item is available from stock, and (7) one item has an insufficient budget justification.

Recommendation

We recommend that the Senate and House Committees on Appropriations reduce the Navy's ammunition budget request by $62.6 million for 16 ammunition items in 10 budget lines, as shown in appendix II.

Air Force Ammunition Program

The Air Force requested $677.7 million for ammunition in its fiscal year 1989 budget. We reviewed the justifications for nine budget line items representing $413.4 million, or about 61 percent of the funds requested. Appendix III shows the items we reviewed and the potential reductions we identified. In total, we believe that $293.6 million for eight budget line items is not needed in fiscal year 1989 for the following reasons:

- $156.7 million is for three items for which total program quantities will not be delivered during the fiscal year 1989 funded delivery period.
- $89.5 million is for an item that requires additional testing to demonstrate the reliability of the weapon system.
- $30.3 million is for two items that are not needed because inventory would exceed requirements.
- $16.3 million is for an item with production problems.
- $0.8 million is for an item with an overstated unit cost and an optimistic production schedule.

Deliveries Not Within Funded Delivery Period

A total of $156.7 million of the $278.8 million requested for three items is not needed because part of the requested quantities cannot be delivered within the fiscal year 1989 funded delivery period:

- $147.5 million for CBU-87 combined effects munitions (CEM),
- $2.5 million for MJU-7B flares, and
- $6.7 million for MJU-10B flares.

CEM Program

The $252.9 million the Air Force requested for 16,562 CEMs could be reduced by $147.5 million because 9,661 CEMs are not scheduled to be delivered during the fiscal year 1989 funded delivery period.

Because of delays in establishing production lines at contractor plants, scheduled deliveries of quantities funded in fiscal years 1985 through 1988 have been delayed. Fiscal year 1985 program deliveries, for example, were delayed 4 months due to contractor production line problems. These problems also contributed to delays of the fiscal years 1986 and 1987 programs. Last year we reported that fiscal year 1988 program deliveries were expected to occur 7 months into the fiscal year 1989 funded delivery period.

Budget support documents for the fiscal year 1989 program show a 17-month procurement lead time. Deliveries for the fiscal year 1989 program should therefore begin in March 1990 and end in February 1991.

However, deliveries of the fiscal year 1988 program are not scheduled to be completed until September 1990. As a result, fiscal year 1989 deliveries cannot begin until October 1990, or 7 months after the fiscal year 1989 funded delivery period begins. Therefore, based on the Air Force's planned delivery schedule, the procurement of 9,661 of the 16,562 CEMs should be deferred, and the budget could be reduced by about $147.5 million.

Air Force representatives advised us that both contractors have agreed to accelerate production without additional cost to the government. We believe that it would be more advantageous to follow the production schedule as shown in the Air Force's fiscal year 1989 budget. According to an Air Force official, the planned budget quantity for fiscal year 1990 is not expected to be large enough to support two producers. By following its original production schedule, the Air Force could defer the procurement of 9,661 CEMs to fiscal year 1990 and thus maintain two producers.

Flare, IR MJU-7B

The $9.8 million request for 563,400 MJU-7B flares could be reduced by about $2.5 million because 3 months of deliveries will extend into the fiscal year 1990 funded delivery period.

Contractor safety and operational problems have slowed deliveries of MJU-7B flares since the fiscal year 1984 program. According to a production official in the office of the single manager for conventional ammunition, these problems will also delay fiscal year 1988 program deliveries.

The procurement lead time for the MJU-7B flare is 15 months for the fiscal year 1989 program; thus, deliveries should begin in January 1990 and end in December 1990. However, fiscal year 1988 program deliveries are not scheduled to be completed until March 1990; therefore, fiscal year 1989 deliveries cannot begin until April 1990. Because a 12-month delivery period is needed to complete the fiscal year 1989 program, 3 months of deliveries (140,850 flares) will extend beyond the fiscal year 1989 funded delivery period. Therefore, the fiscal year 1989 budget request should be reduced by about $2.5 million for the 140,850 flares.

Air Force representatives said that according to the Army's production schedule, fiscal year 1989 program quantities can be produced at a rate of 70,000 flares per month over an 8-month period ending in August

1990. We believe that this production schedule is overoptimistic because, according to an Army official, the Longhorn Army Ammunition Plant's one-shift production rate is 22,000 flares per month, and although a second contract is expected to be awarded in December 1988, the second contractor will have to pass a first article test that could delay deliveries of the fiscal years 1988 and 1989 programs.

Flare, IR MJU-10B

The $16.1 million request for 354,114 MJU-10B flares could be reduced by about $6.7 million because at least 5 months of deliveries will extend into the fiscal year 1990 funded delivery period.

Production of the MJU-10B flare has been delayed by about 2 years because the flare was redesigned to prevent damage to aircraft. Two contractors were involved in redesigning the flare. Further, delays will occur because of the time required to transfer procurement responsibility of the flare and to competitively select contractors to produce the fiscal year 1988 program. The Ogden Air Logistics Center plans to transfer procurement responsibility to the single manager for conventional ammunition in September 1988. Single manager procurement officials estimated that it will take 15 to 24 months after receiving procurement responsibility to competitively select contractors for the fiscal year 1988 program. If contractors can be competitively selected within 15 months, production for the fiscal year 1988 program would begin in January 1990 and end in July 1990, based on the estimated production capacity of the two potential contractors.

Budget support documents show a 17-month procurement lead time for the fiscal year 1989 program; therefore, deliveries should begin in March 1990 and end in February 1991. However, because deliveries of the fiscal year 1988 program would not be completed until July 1990, fiscal year 1989 deliveries cannot begin until August 1990. Based on a 12-month delivery period, fiscal year 1989 deliveries would be completed in July 1991, or 5 months after the end of the fiscal year 1989 funded delivery period. Consequently, funding for about 147,548 flares could be deferred, and the request could be reduced by about $6.7 million.

If 24 months are needed to select contractors for the fiscal year 1988 program, none of the deliveries for the fiscal year 1989 program can be made within the funded delivery period, and the entire request of $16.1 million should not be funded.

Air Force representatives agreed with our recommended reduction of $6.7 million.

Additional Testing Needed

As discussed in chapter 3, the $89.5 million request for Bigeye chemical weapons should not be funded because additional testing is needed to demonstrate weapon system reliability.

Inventory Will Exceed Requirements

A total of $30.3 million of the $88.2 million requested for two items is not needed because the requested quantities will cause the inventories for these items to exceed the Air Force's inventory objective. Specifically, the $30.3 million includes

- $21 million for 20-mm training cartridges and
- $9.3 million for 30-mm training cartridges.

20-mm Training Cartridge

The $21 million the Air Force requested for 9.2 million 20-mm training cartridges should not be funded because requirements were overstated.

In developing its budget request for 9.2 million 20-mm training cartridges, the Air Force did not consider about 3.9 million cartridges that were due in from the fiscal year 1987 and prior year programs. Also, the Air Force did not consider a reprogramming action for the procurement of additional cartridges and made an error in computing the assets due in from fiscal year 1987 and prior year programs. As a result, the Air Force overstated its request by about $8.9 million for about 3.9 million cartridges.

The Air Force further overstated its fiscal year 1989 request by projecting an annual expenditure rate of 9.2 million cartridges. When compared to past experiences, this projected rate seems excessive, as shown in table 4.1.

Table 4.1: Number of 20-mm Training Cartridges Used Annually

Calendar year	Quantity
1983	4,245,000
1984	4,869,000
1985	6,908,676
1986	5,178,995
1987	4,663,436

Based on this data, consumption averaged about 5.2 million cartridges annually over the 5-year period and about 5.6 million cartridges for calendar years 1985 through 1987. Using this higher consumption figure, the number of training cartridges on hand would exceed the Air Force's fiscal year 1989 inventory objective without a fiscal year 1989 program. Consequently, the Air Force's fiscal year 1989 request of $21 million for 9.2 million training cartridges should not be funded.

Air Force officials said that historical consumption is not a reliable indicator of future requirements because past expenditures for 20-mm cartridges were constrained due to the unavailability of assets. Yet, budget support documents for fiscal years 1987 and 1988 indicate that 9.2 million cartridges were available for training each year.

30-mm Training Cartridge

The $67.2 million requested for 8.7 million 30-mm training cartridges could be reduced by about $9.3 million because the requested program will result in an excess inventory at the end of the fiscal year 1989 program and forecasted annual consumption is overstated.

The fiscal year 1989 program provides about 1 million training cartridges above the inventory objective. In addition, the forecast consumption is overstated by about 200,000 cartridges when compared with expenditures during recent years. Budget backup data indicates that the Air Force will use 8 million cartridges from the fiscal year 1989 program for training. However, actual use the past 3 years averaged 7.8 million cartridges. Using this lower consumption figure, coupled with the 1 million cartridges above the inventory objective, results in a potential reduction of 1.2 million cartridges estimated to cost $9.3 million.

Air Force representatives said that excess 30-mm cartridges could be used to build the inventory to a more desirable level.

Production Problems

As discussed in chapter 3, the Air Force's $16.3 million request for 90,000 2.75-inch MK66 rocket motors should not be funded because of problems in producing the MK90 propellant grain, a component of the MK66 rocket motors.

Overstated Unit Cost and Optimistic Production Schedule

The Air Force's $3.5 million request to buy 3,800 AT-4 weapons should be reduced by $0.8 million because, as discussed in chapter 2, costs were overstated and production schedules are overoptimistic.

Air Force's Proposed Budget Changes

Air Force representatives identified changes they would like to make to the fiscal year 1989 budget, as shown in table 4.2.

Table 4.2: Air Force's Proposed Budget Changes

Item	Quantity	Cost
Increases		
MK-84 bomb, empty	10,000	$12,250,000
BDU-50 bomb, practice	7,180	1,975,000
Hard target bomb, 2,000 lb.	500	5,600,000
Total		**$19,825,000**
Decreases		
30-mm training cartridges	1,200,000	$9,264,000
20-mm training cartridges	2,000,000	4,940,000
MJU-10/B IR flare	124,000	5,621,000
Total		**$19,825,000**

Conclusion

We believe that the Air Force's fiscal year 1989 ammunition budget request could be reduced by $293.6 million because (1) three items cannot be delivered during the fiscal year 1989 funded delivery period, (2) one item requires additional testing prior to full production approval, (3) requested quantities for two items will cause inventories to exceed inventory objectives if funded, (4) one item has production problems, and (5) estimated costs for one item are overstated and its production schedule is overoptimistic.

Recommendation

We recommend that the Senate and House Committees on Appropriations reduce the Air Force's ammunition budget by $293.6 million for eight budget line items, as shown in appendix III.

Marine Corps Ammunition Program

The Marine Corps requested $225.3 million in fiscal year 1989 for ammunition. We reviewed the justification for 12 items representing $62.3 million, or about 28 percent of the request. Appendix IV shows the budget lines we reviewed and the potential reductions we identified. In total, we believe that $8.4 million is not needed in fiscal year 1989 for two items for the following reasons:

- $4.9 million is for an item for which total program quantities will not be delivered during the fiscal year 1989 funded delivery period.
- $3.5 million is for an item with an overstated unit cost and an optimistic production schedule.

Deliveries Not Within Funded Delivery Period

The Marine Corps requested $4.9 million for 1,187 ADAM projectiles in fiscal year 1989. As discussed in chapter 2, because of malfunctioning components, the Army's ADAM program experienced a slippage. As a result, fiscal year 1989 program quantities are scheduled for production after the fiscal year 1989 funded delivery period. The request should therefore not be funded in fiscal year 1989.

Overstated Unit Cost and Optimistic Production Schedule

The Marine Corps requested $13.8 million for 14,912 light antiarmor weapons in fiscal year 1989 and plans to procure the lightweight multipurpose weapon known as the AT-4. As discussed in chapter 2, the Army overstated the unit cost of the weapon, and the production schedule is overoptimistic. The Marine Corps' budget should therefore be reduced by $3.5 million.

Conclusion and Recommendation

We believe that $8.4 million of the Marine Corps' fiscal year 1989 request is not needed for two items. Accordingly, we recommend that the Senate and House Committees on Appropriations reduce the Marine Corps' ammunition budget by $8.4 million, as shown in appendix IV.

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Appendix I

Potential Reductions to the Army's Ammunition Request

Dollars in millions

Budget line number	Item	Budget request	Potential reductions	Adjusted request	Remarks
3	Cartridge, 5.56-mm, all types	$57.1	$0	$57.1	-
13	Cartridge, 7.62-mm, all types	37.3	7.9	29.4	Inventory will exceed needs (see p. 22).
18	Cartridge, .45-caliber ball, M1911	1.3	0	1.3	-
22	Cartridge, .50 caliber blank, T928	0.2	0	0.2	-
23	Cartridge, 20-mm TP-T, M220, linked	6.3	0	6.3	-
24	Cartridge, 20-mm 4TP/ 1TP-T, linked	2.9	0	2.9	-
26	Cartridge, 25-mm TP-T, M793, linked	10.2	10.2	0	Inventory will exceed needs (see p. 21).
27	Cartridge, 25-mm AP training round	45.2	0	45.2	-
28	Cartridge, 30-mm TP, M788, linked	6.0	0	6.0	-
29	Cartridge, 40-mm, all types	30.6	3.9	26.7	Planned type classification does not support procurement (see p. 23).
38	Cartridge, 60-mm smoke, WP, XM722	4.1	0	4.1	-
44	Cartridge, 81-mm 1/10 range practice, M880	4.5	0	4.5	-
45	Cartridge, 4.2-inch HE, M329A2	20.0	20.0	0	Unresolved functioning problems (see p. 18).
46	Cartridge, 4.2-inch mortar, illuminating	37.4	37.4	0	Unresolved functioning problems (see p. 18).
54	Cartridge, 105-mm TP-T, M490	14.9	0	14.9	-
55	Cartridge, 105-mm DS-TP, M724	25.8	0	25.8	-
58	Cartridge, 120-mm APFSDS-T, M829	130.6	0	130.6	-
59	Cartridge, 120-mm HEAT-MP-T, M830	29.5	0	29.5	-
60	Cartridge, 120-mm TP-T, M831	44.2	0	44.2	-
61	Cartridge, 120-mm TPCSDS-T, M865	75.7	0	75.7	-
63	Projectile, 155-mm HE, ICM, M483	103.2	0	103.2	Questionable item (see p. 25).
67	Projectile, 155-mm smoke, M825	19.5	15.0	4.5	Deliveries not within funded delivery period (see p. 17).

(continued)

Budget line number	Item	Budget request	Potential reductions	Adjusted request	Remarks
68	Projectile, 155-mm HE, ADAM, M731	$51.5	$51.5	$0	Deliveries not within funded delivery period (see p. 14).
69	Projectile, 155-mm HE, RAAMS, M718	22.3	0	22.3	-
70	Projectile, 155-mm HE, RAAMS, M741	21.2	0	21.2	-
71	Projectile, 155-mm basebleed, XM864	111.7	0	111.7	Questionable item (see p. 24).
73	Projectile, 155-mm GB-2, M687	66.0	20.1	45.9	Deliveries not within funded delivery period (see p. 16).
74	Projectile, 155-mm training, M804	15.7	0	15.7	-
76	Propelling charge, 155-mm red bag, M203	129.7	0	129.7	-
77	Propelling charge, 155-mm red bag, M119	29.1	0	29.1	-
81	Projectile, 8-inch HE, RAP, M650	37.0	37.0	0	Deliveries not within funded delivery period (see p. 15).
84	Fuze, MTSQ, M577A1	5.6	0	5.6	-
85	Fuze, MTSQ, M582	10.3	0	10.3	-
86	Fuze, ET, XM762	23.2	0	23.2	-
89	GEMSS AT mine, M75	5.0	0	5.0	-
90	Canister mine, practice, XM88 (Volcano)	2.4	0	2.4	-
91	Canister mine, XM87 (Volcano)	73.9	19.3	54.6	Deliveries not within funded delivery period (see p. 16).
92	Rocket motor, MK22	7.8	0	7.8	-
93	Line charge, M58A3 (MICLIC)	35.7	0	35.7	-
95	Modular pack mine system (MOPMS)	33.1	0	33.1	-
97	Demolition munitions and others	22.4	0	22.4	-
98	Linear-Shaped Charge	2.8	0	2.8	-
100	Lightweight multipurpose weapon	71.6	18.1	53.5	Overstated unit cost and optimistic production schedule (see p. 19).
101	Lightweight multipurpose weapon, trainer	3.3	0	3.3	-
102	Hydra 70 rocket, HE, w/M433 RS fuze	16.6	0	16.6	-
105	Hydra 70 rocket, MPSM practice, M267	3.8	3.8	0	Deliveries not within funded delivery period (see p. 17).
106	Hydra 70 rocket, HE/PD, M151/ M423/ MK66	5.2	5.2	0	Deliveries not within funded delivery period (see p. 17).
107	Hydra 70 rocket, signature practice, XM274	44.3	0	44.3	-
108	Hand grenades, all types	6.9	0	6.9	-

(continued)

Budget line number	Item	Budget request	Potential reductions	Adjusted request	Remarks
112	Simulators, all types	$4.1	$0	$4.1	-
115	Items less than $2 million	10.9	0	10.9	-
121	Host nation support	29.1	0	29.1	-
Total[a]		**1,608.7**	**249.4**	**1,359.3**	
Total[b]		191.3	0	191.3	
Total		**$1,800.0**	**$249.4**	**$1,550.6**	

[a]Total for budget lines we reviewed.

[b]Total for budget lines we did not review.

Appendix II

Potential Reductions to the Navy's Ammunition Request

Dollars in millions

Budget line number	Item	Budget request	Potential reductions	Adjusted request	Remarks
190	General purpose bombs	$31.3	$0	$31.3	-
193	Rockeye	0.9	0	0.9	-
195	2.75-inch rocket	18.7	9.4	9.3	Problems producing propellant grains for MK66 rocket motor (see p. 28).
197	Machine gun ammunition	13.0	0	13.0	-
198	Practice bombs	43.0	13.6	29.4	Problems producing components for MK83 bombs (see p. 29). Laser-guided training round program delayed (see p. 32).
201	Airborne expendable countermeasures	17.5	0	17.5	-
204	Bigeye chemical weapon	9.9	9.9	0	Additional testing needed prior to full production approval (see p. 33).
205	Jet assisted takeoff	4.8	3.1	1.7	Programs for the MK23 motor and MK296 igniter will result in inventory exceeding needs (see p. 35). No budget justification for the rocket assisted takeoff (see p. 36).
206	Gator	13.4	0	13.4	-
207	Miscellaneous air-launched ordnance	2.2	1.0	1.2	Programs for the Smokey SAM rocket, igniter, and launcher will result in inventory exceeding needs (see p. 35).
222	5-inch, 54-caliber gun ammunition	48.6	3.8	44.8	HIFRAG projectile has a production backlog (see p. 30).
224	16-inch gun ammunition	24.1	14.8	9.3	Submunition round is still being tested and production approval is delayed (see p. 32).
225	CIWS ammunition	40.7	2.9	37.8	Programs for the 20-mm dummy and target practice rounds will result in inventories exceeding needs (see p. 34).
226	76-mm gun ammunition	9.5	1.3	8.2	MK417 fuzes are available from inventory (see p. 35).
227	Other ship gun ammunition	18.0	0	18.0	-
255	Small arms and landing party ammunition	33.4	2.8	30.6	Overstated unit cost and optimistic production schedule for the AT-4 (see p. 35).
Total[a]		**329.0**	**62.6**	**266.4**	
Total[b]		110.9	0	110.9	
Total		**$439.9**	**$62.6**	**$377.3**	

[a]Total requested for these budget lines. We reviewed requests for items totaling $310.8 million.

[b]Total for items in budget lines that we did not review.

Potential Reductions to the Air Force's Ammunition Request

Dollars in millions

Budget line number	Item	Budget request	Potential reductions	Adjusted request	Remarks
1	2.75-inch rocket motor	$16.3	$16.3	$0	Production problems (see p. 42).
3	Light antitank tactical AT-4 rocket	3.5	0.8	2.7	Overstated unit cost and optimistic production schedule (see p. 43).
9	Cartridge, 20-mm training	21.0	21.0	0	Inventory will exceed needs (see p. 41).
10	Cartridge, 30-mm training	67.2	9.3	57.9	Inventory will exceed needs (see p. 42).
35	CBU-87, combined effects munition	252.9	147.5	105.4	Deliveries not within funded delivery period (see p. 38).
36	Bigeye	89.5	89.5	0	Additional testing is required to demonstrate the reliability of the weapon system (see p. 41).
40	Flare, IR, MJU-7B	9.8	2.5	7.3	Deliveries not within funded delivery period (see p. 39).
44	Flare, MJU-10B	16.1	6.7	9.4	Deliveries not within funded delivery period (see p. 40).
49	FMU-139 fuze	30.1	0	30.1	-
Total[a]		**506.4**	**293.6**	**212.8**	
Total[b]		171.3	0	171.3	
Total		**$677.7**	**$293.6**	**$384.1**	

[a]Total requested and reviewed in these budget lines.

[b]Total for items in budget lines that we did not review.

Potential Reductions to the Marine Corps' Ammunition Request

Dollars in millions

Budget line number	Item	Budget request	Potential reductions	Adjusted request	Remarks
1	5.56-mm, all types	$14.6	$0	$14.6	-
2	7.62-mm, all types	2.6	0	2.6	-
6	40-mm, all types	13.6	0	13.6	-
8	60-mm smoke, WP	6.1	0	6.1	-
13	120-mm HEAT, MP-T, M830	5.4	0	5.4	-
14	120-mm TP-T, M831	1.4	0	1.4	-
15	155-mm HE, ADAM	4.9	4.9	0	Deliveries not within funded delivery period (see p. 44).
16	155-mm HE, RAAMS	10.2	0	10.2	-
17	155-mm HE, DP, ICM, M483	5.0	0	5.0	-
18	155-mm charge, prop, red bag	5.9	0	5.9	-
22	Light antiarmor weapon	13.8	3.5	10.3	Overstated unit cost and optimistic production schedule (see p. 44).
26	Grenades, all types	4.5	0	4.5	-
Total[a]		**88.0**	**8.4**	**79.6**	
Total[b]		137.3	0	137.3	
Total		**$225.3**	**$8.4**	**$216.9**	

[a]Total requested for these budget lines. We reviewed requests for items totaling $62.3 million under these budget lines.

[ab]Total for budget lines we did not review.

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